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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/020,977	12/19/2001	Yukihiro Shibata	520.40997X00	1174
20457	7590	10/05/2004		
ANTONELLI, TERRY, STOUT & KRAUS, LLP 1300 NORTH SEVENTEENTH STREET SUITE 1800 ARLINGTON, VA 22209-9889			EXAMINER STOCK JR, GORDON J	
			ART UNIT 2877	PAPER NUMBER

DATE MAILED: 10/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/020,977

Applicant(s)

SHIBATA ET AL.

Examiner

Gordon J Stock

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4, 5, 8-20 is/are rejected.
- 7) ☒ Claim(s) 3, 6 and 7 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. **Claim 4** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. The term "in the neighborhood" in claim 4 is a relative term which renders the claim indefinite. The term "in the neighborhood" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The term "in the neighborhood" renders the position of the spatial filter indefinite.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an

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international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

5. **Claims 1, 2, 4, 5, 8, 10-13, 15-20** are rejected under 35 U.S.C. 102(b) as being anticipated by **Maeda et al. (5,774,222)**.

As for **claims 1, 2, 4, 5, 16, 17**, Maeda in a method and apparatus for inspecting defects of patterns discloses the following: obtaining an image signal of a sample by imaging said sample through an objective lens of a bright field optical system (Fig. 1: 3, 9, 12a); adjusting optical conditions of said bright field optical system so as to decrease a difference of contrast, balancing first order and zeroth order intensities, among pattern signals; whereas, adjustment of the transmission ratio of diffracted light via a spatial filter, an attenuation filter and mask system (col. 14, lines 45-65; Fig. 1: 14a, 14, 38)); obtaining the image signal of said sample under adjusted conditions by imaging said sample through objective lens (col. 22, lines 15-55; col. 23, lines 15-40); detecting a defect of said sample by processing the image signal (col. 7, lines 1-30; col. 8, lines 7-25); whereas, the transmission percentage of diffracted light is done via a spatial filter, attenuation filter, that is positioned near the Fourier transform plane and via a mask for controlling illumination (col. 9, lines 28-45; Fig. 1: 14a, 14, 38)); illuminating a sample through an objective lens (Fig. 1: 3, 9); obtaining a plurality of images having different transmissions of zeroth order diffraction light through said objective lens by changing attenuation of zeroth order diffracted light; determining conditions and optimizing conditions of the transmission to increase sensitivity (col. 22, lines 25-65; col. 23, lines 15-40); obtaining the image signal of said sample under adjusted conditions by imaging said sample through objective lens (col. 22, lines 15-55;

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col. 23, lines 15-40); detecting a defect of said sample by processing the image signal (col. 7, lines 1-30; col. 8, lines 7-25); whereas, brightfield illumination, annular looped illumination, is used (col. 31, line 42; Fig. 1).

As for **claims 11, 12, 19**, Maeda in an apparatus for inspecting defects discloses: a stage (Fig. 1: 2); an illuminating system with an objective lens (Fig. 1: 3, 9); an optical control unit which controls a transmission ratio of light illuminated by said illuminating system and reflected (Fig. 1: 14, 14a, and 38); an imaging optical system, image detecting unit, and defect detecting section (Fig. 1: 8a, 8b, 13, 12a, 15a, 17, 20); contrast calculating unit (Fig. 38); whereas, brightfield illumination, annular looped illumination, is used (col. 31, line 42; Fig. 1).

As for **claims 8, 10, 13, 15, 18, 20**, Maeda in an apparatus for inspecting defects discloses: illuminating a sample by polarized light through an objective lens (Fig. 35: 9); obtaining an image of said sample by imaging said illuminated sample through said objective lens (col. 34, lines 1-4); adjusting polarization conditions based upon contrast and obtaining the image based on adjusted conditions and detecting defect of said sample by using the image (col. 34, lines 15-60; col. 35, lines 1-45); wherein contrast can be adjusted by adjusting polarization conditions (col. 34, lines 50-65); a stage (Figs. 31-33 having same design as Fig. 1; col. 31, lines 20-25; Fig. 1: 2); an illuminating system with brightfield illumination (col. 31, lines 25-45); polarization adjusting unit (col. 33, lines 30-60); imaging unit and defect detecting unit (col. 31, lines 25-50; col. 34, lines 15-45).

6. **Claims 8-15, 18-20** are rejected under 35 U.S.C. 102(e) as being anticipated by **Maeda et al. (6,621,571)**.

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As for **claims 8-15, 18-20**, Maeda discloses in a method and apparatus for inspecting defects in a patterned specimen the following: illuminating a sample by polarized light through an objective lens and obtaining an image of said sample by imaging said illuminated sample through objective lens (Fig. 25; col. 13, lines 10-15 and 35-40; col. 14, lines 15-25); adjusting polarization conditions of light generated by illumination and reflected from sample based upon contrast information (col. 13, lines 12-20); obtaining image based upon polarization condition adjustment (col. 13, lines 25-55); detecting a defect of sample obtained through adjusted conditions (col. 13, lines 40-55; col. 14, lines 15-50); wherein the transmission ratio of zeroth order diffracted light is changed through adjusting polarization conditions and contrast is adjusted by adjusting polarization conditions (col. 13, lines 15-20; col. 13, lines 35-51); a stage (Fig. 25: 2); an illuminating system through an objective lens (Fig. 25: 3 and 7); an optical control unit/polarizing adjustment unit (Fig. 25: 241, 242; col. 13, lines 10-22; col. 13, lines 40-50); an imaging optical system, image detecting unit, and defect detecting section (Figs. 1 and 25; col. 13, lines 50-65; col. 14, lines 10-45); whereas, the illumination system is brightfield (Figs. 1 and 25).

7. **Claims 11, 12, 13, 19, 20** are rejected under 35 U.S.C. 102(b) as being anticipated by **Worster et al. (5,479,252)**.

As for **claims 11, 12, 13, 19, and 20**, Worster in a laser imaging system for inspection and analysis of sub-micron particles discloses the following: a stage (Fig. 2: 216-218); an illuminating system with objective lens (Fig. 2: 201, 205); an optical control unit which controls a transmission ratio of light, a polarization adjusting unit (Fig. 2: 203, 204); an imaging optical system, imaging detecting unit, and defect detecting system (Fig. 2: 208, 207, 204, 212-215);

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contrast calculating unit (col. 9, lines 48-60); brightfield illumination through illumination normal to the sample (Fig. 2: 201-203; 205) and brightfield objective lenses (col. 15, lines 34-35).

Allowable Subject Matter

8. **Claims 3, 6, and 7** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

As to **claim 3**, the prior art of record, taken alone or in combination, fails to disclose or render obvious in a method for detecting a defect utilizing a polarization difference between the zeroth order diffracted light and higher order diffracted light, in combination with the rest of the limitations of **claim 3**.

As to **claim 6**, the prior art of record, taken alone or in combination, fails to disclose or render obvious in a method for detecting a defect a brightness difference of the detected images among the plurality of regions of said sample is decreased is set as conditions for increasing defect detection sensitivity in combination with the rest of the limitations of **claim 6**.

As to **claim 7**, the prior art of record, taken alone or in combination, fails to disclose or render obvious in a method for detecting a defect summing up the secondary differential values; whereas, the secondary differential values' summation is increased is set as a condition for increasing said defect detection sensitivity, in combination with the rest of the limitations of **claim 7**.

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Response to Arguments

9. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

Fax/Telephone Numbers

If the applicant wishes to send a fax dealing with either a proposed amendment or a discussion with a phone interview, then the fax should:

- 1) Contain either a statement "DRAFT" or "PROPOSED AMENDMENT" on the fax cover sheet; and
- 2) Should be unsigned by the attorney or agent.

This will ensure that it will not be entered into the case and will be forwarded to the examiner as quickly as possible.

Papers related to the application may be submitted to Group 2800 by Fax transmission. Papers should be faxed to Group 2800 via the PTO Fax machine located in Crystal Plaza 4. The form of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The CP4 Fax Machine number is: (703) 872-9306

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gordon J. Stock whose telephone number is (571) 272-2431.

The examiner can normally be reached on Monday-Friday, 10:00 a.m. - 6:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr., can be reached at 571-272-2800 ext 77.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

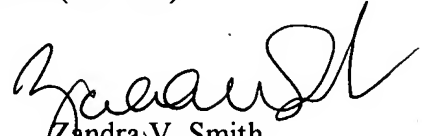
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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private Pair system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



gs

September 29, 2004



Zandra V. Smith
Primary Examiner
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